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SUBJECT—

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REPORT OF PINE BEETLE SURVEYS

On the

YAKIMA INDIAN RESERVATION, WASHINGTON

Seasons of 1947 and 1948

By

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Portland 5, Oregon
December 20, 1948

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REPORT OF PINE BEETLE SURVEYS

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INTRODUCTION

Since 1931 surveys, designed to follow the trend of pine beetle losses and to determine the needs for control measures, have been conducted cooperatively in the ponderosa pine stands of the Yakima Indian Reservation by the Indian Service and the Portland Forest Insect Laboratory. This report covers the results of the surveys made during the seasons of 1947 and 1948, each of which consisted primarily of a 100 percent recruise of five 320-acre check plots in virgin stands and one 280-acre cutover plot in the Dry Creek Sale area. The 1947 survey was conducted during the period from September 29 to October 2 inclusive by C. E. Chester and N. Caywood of the Indian Service and the writer. The 1948 survey was completed during the period from September 28 to October 1 inclusive by C. E. Chester, S. Johnson, and P. Clemments of the Indian Service and the writer. The costs of each survey, except for the salary and expenses of the writer, were carried by the Indian Service.

RESULTS OF THE SURVEY

Practically all of the losses found during the surveys were the result of attacks by the western pine beetle (Dendroctonus brevicomis Lec.). Minor losses were caused by the mountain pine beetle (D. monticolae Hopk.) and species of Ips and Melanophila.

Losses in Virgin Stands

The mortality of ponderosa pine on the five virgin check plots again showed a considerable range in intensity and severity. In 1946 (See Table 1) the gross losses ranged from 3 to 191 board feet per acre or 0.04 to 2.04 percent of the stand with the Logy Creek and Castile Crossing plots again showing the highest mortalities. The average for the five plots was 73 board feet per acre or 0.77 percent of the stand which represented a 23 percent increase over the losses of 1945.

As shown in Table 1, the average mortality on the five virgin plots in 1947 were considerably lower than that of 1946, equalling 52 board feet per acre or 0.56 percent of the stand volume. The Trout Creek and Olney Corral plots, on which only a few insect-killed trees are usually marked, both showed marked increases in volume losses in 1947. However, in spite of these increases, the infestation on these plots still represents only a low normal condition. The highest losses in 1947 were found on the Logy Creek plot but even these represented a decrease of 41 percent from those of the previous year. During these years of better moisture and growing conditions, losses of this low intensity are more than offset by annual growth.

When the plots were recruised in 1948, approximately 63 percent of the probable losses for the current year were picked up by the spotters. On the basis of these partially completed surveys it is evident that the mortality for 1948 will be about 10 percent lower than that of 1947. No direct control measures are warranted under these infestation conditions.

Losses in Cutover Stands

As mentioned in previous reports, the record of insect activity in cutover stands on the Yakima Indian Reservation is limited to the data collected from the Smith Springs plot (280 acres) cutover on a sanitation-salvage basis in 1944. This plot has been recruised annually since cutting to provide one check on the trend of pine beetle losses following this type of cutting.

Table 1 shows that 7 trees with a total of 3,230 board feet were killed in 1946 and 22 trees with a total of 6,290 board feet were killed by insects in 1947.

The following is a summary of the total and average losses on the Smith Springs plot before and after cutting:

	Before Cutting: (4 years, 1941-44)	After Cutting: (3½ years, 1945-48)
Total No. of Trees	170	38
Total Volume	153,830	11,380
Average No. of Trees	42	11
Average Volume (Bd.Ft.)	38,460	3,200
Average Loss Per Tree (Bd.Ft.)	910	300
Average Loss Per Acre Per Year (Bd. Ft.)	137	12

These records to date indicate a reduction of 74 percent in the average number of trees killed and a 92 percent reduction in the average volume loss after cutting. An examination of the field sheets, on which the dead trees were graded as to merchantability, shows that part of the loss after cutting can be further segregated. Many of the trees on the cutover plot were unmerchantable and would probably have died even under virgin stand conditions. In the following summary all trees killed after cutting have been classified as to their merchantability:

	Unmerchantable Trees	Merchantable Trees Unmarked	Merchantable Trees Marked but Uncut	Total
No. of Trees Killed	25	9	4	38
% of Total	66	24	10	100
Volume of Trees Killed	3,900	4,530	2,950	11,380
% of Total	34	40	26	100
Average DBH	13.7"	20.4"	23.0"	
Average Bd. Ft. Per Tree	160	500	740	

Of the trees killed on the Smith Springs plot since cutting, 66% of the total number and 34% of the total volume have been unmerchantable; therefore, the interest in these data rests in the trees missed by the timber markers (unmarked) and those missed by the cutters (marked but uncut). The records on this one plot indicate that the "unmarked" trees were of small diameter and could well be marginal trees for this sale; however, the loss in this class of trees has not been large which speaks well for the markers and the marking rule used on this sale. To date, the data indicate a very satisfactory control of pine beetle losses has resulted from this first sanitation-salvage operation.

Losses on the Reservation as a Whole

As a result of the surveys, estimates of gross insect-caused losses in the stands of ponderosa pine on the Yakima Indian Reservation have been made as follows:

Year	No. of Trees	Volume (Bd. Ft.)
1946	21,000	19,000,000
1947	18,000	11,000,000

Most of this mortality has been offset by growth, which has, however, occurred in the younger age classes.

RECOMMENDATIONS

Because of the greatly improved conditions relating to moisture and tree growth and the low level of pine beetle losses, no direct control measures are warranted at this time. The splendid results of the first sanitation-salvage operation on this reservation speak well for its extension into other critical areas. The Forestry Division of the Indian Service is cognizant of this recommendation and has already made plans for other sales of a similar nature.

TABLE 1. Pine Timber Killed by Insects in 1946 and 1947 on 320 Acre Check Plots, Yakima Indian Reservation

CHECK PLOTS				1946 LOSSES					1947 LOSSES				
					GROSS VOLUME (BM)					GROSS VOLUME (BM)			
Name and Location	No.	Acres	Pine Volume MBM	No. of Trees	Total	Per Acre	% Stand	Ratio to 1945	No. of Trees	Total	Per Acre	% Stand	Ratio to 1946
Trout Creek T7N, R13E, Sec. 17W/2	4	320	1,900	16	6,720	21	.35	.74	20	14,390	45	.76	2.14
So. Cedar Valley T6N, R14E, Sec. 9W/2	6	320	2,200	8	7,930	25	.36	.61	5	3,400	11	.15	.43
Castile Crossing T9N, R12E, Sec.13W/2	12	320	5,200	37	38,610	121	.75	1.05	29	23,970	75	.46	.62
Logy Creek T7N, R16E, Sec. 10W/2	14	320	3,000	66	61,390	191	2.04	1.65	62	36,010	112	1.20	.59
Olney Corral T10N, R14E, Sec. 27W/2	16	320	2,500	3	910	3	.04	1.65	13	4,550	15	.18	5.00
Total 5 Plots		1580	14,800	130	114,850	73	.77	1.23	132	82,320	52	.56	.72
Average Per Section		640	5,900	52	45,940	73	.77	1.23	53	32,930	52	.56	.72
CUTOVER PLOT													
Smith Springs T8N, R15E, Sec/ 2E/2	15	280	*	7	3,230	12	*	1.04	22	6,290	22	*	1.94

* Plot not cruised after cutting.